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Canada's

Agriculture, Food and Beverage

INDUSTRY

Food Safety

Environment

Innovation



Growing Innovation

The Canadian agriculture and agri-food sector is known as one of the most dynamic and innovative high-tech agricultural industries in the world, featuring top-notch management, cutting-edge research, and well-established, predictable regulatory systems.

Canada's objective is to be the world leader in food safety, innovation and environmentally responsible production and to be the best at meeting the needs of consumers at home and abroad.

Here are some of Canada's key agriculture and agri-food industries.

Canada

Food Safety

Environment

Innovation

Alcoholic beverages industry

In 2000, Canada exported over \$1 billion in distilled spirits, beer and wine. Exports of distilled spirits totalled nearly \$655 million, beer exports were valued at over \$326 million, and wine exports totalled more than \$80 million of which over \$70 million was other than grape wines, including fermented beverages, cider, fruit wines, perry, mead and hard lemonades.

Part of the industry's success lies in readily available crops, such as grains for distillation and high-quality malting barley—which account for 30 per cent of the world's market trade—for beer.

Innovation also plays a role. An award-winning Canadian wine is Icewine, which is made with grapes frozen on the vine. Also, Canadian innovations in yeast development have translated into a competitive edge for local vintners and research is ongoing on cool climate grape varieties. In the distillery sector, Canadian operations have been rationalised and production and distribution technologies have been upgraded. Canadian scientists continue to develop new crops and techniques to improve alcohol products.

Confectionery and snack food industries

The confectionery and snack food industries are very diversified. They include manufacturers of all types of sugar confectionery, chocolates and other cocoa-based products, as well as producers of chewing gum. In 1998, these manufacturers produced \$2.9 billion worth of products, while snack food manufacturers—who produce chips, pretzels, popcorn, seed snacks, peanut, peanut butter and cheesies—shipped \$1.2 billion worth of products.

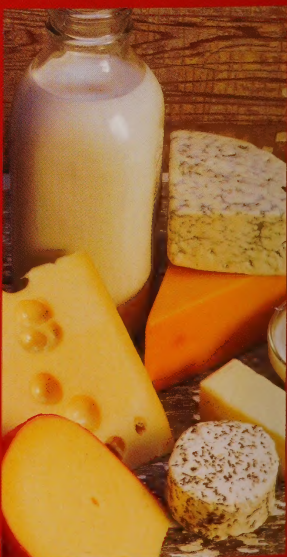
To remain competitive, Canadian snack manufacturers have made significant equipment upgrades to improve productivity. Confectionery manufacturers, on the other hand, are capitalising on one of the fastest growing market segments in the industry by moving into the sugar-free confectionery market.



Dairy industry

Canadian milk and dairy products are recognized internationally for their superior quality. In addition to high-value dairy products such as aged cheddar cheese, some of the finest specialty cheeses, ice cream and dairy beverages, Canada also exports easily stored products like butter, milk powders, and condensed and evaporated milk to developing countries.

Strict quality standards at both the farm and processing levels contribute to Canada's strong reputation for high-quality dairy products.



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L'industrie de l'agriculture, des aliments
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on products,
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opportunities
in the Canadian
agri-food industry
is available on the
Agri-Food Trade
Service Web site at:
<http://ats.agr.ca>.





Egg industry

Each year, 6.5 billion eggs are produced in Canada by more than 24 million laying hens. Canada exported \$26 million of processed eggs to 20 countries in 2001.

Eggs are also used in the manufacturing of many products, including mayonnaise, noodles and baked goods, as well as shampoo, pet foods and adhesives. For Canadian agriculture scientists, eggs are a source of biochemicals. Avidin and ovomucoid—biochemicals derived from eggs—are two highly purified proteins used in drug testing and in geriatric feeding formulas.



Fish and seafood industry

Canada has one of the world's most valuable commercial fishing industries, which takes advantage of the world's longest coastline. The Atlantic fishery accounts for 82 per cent of total landings with top production in herring, shrimp, snow crab, scallops, cod and Canada's most valuable seafood product—lobster.

Aquaculture production in Canada accounts for 10 per cent of the total Canadian production of fish and shellfish, and the country is one of the world's key suppliers of farmed salmon, produced almost exclusively in British Columbia and New Brunswick.

Canada exports more than 75 per cent of its fish and seafood production to more than 80 countries, including the United States, Japan and the European Union.



Floriculture, nursery and Christmas tree industry

Sales by the floriculture, nursery and Christmas tree industry have increased almost 60 per cent since 1996.

In 2000, Canada exported \$409 million worth of floriculture and nursery products to 37 countries, mostly live plants, cut flowers, flower buds, foliage and branches for bouquets or ornamental purposes.



Fruit industry

Apples are Canada's largest fruit crop, with about 543,000 tonnes grown in 2000—worth an estimated \$186 million. Blueberries, grapes, cranberries and peaches are the other biggest sellers, and Canada is the world's largest producer of wild blueberries.

In the past decade, exports of Canadian fruits have increased by almost 14 per cent—from \$236 million in 1990 to \$269 million in 2000.

Functional foods and nutraceuticals industry

The new and emerging market for nutraceuticals and functional foods—natural, bioactive chemical compounds with health-promoting, disease-preventing or medicinal properties—is driven by an increasing consumer understanding of the link between diet and disease, aging populations, rising health-care costs, and advances in food technology and nutrition research.

Canada is well positioned to become a leading supplier of nutraceuticals and functional foods to the world. In addition to an excellent international reputation for a pure, clean environment and resulting safe, high-quality food products, Canada has a strong, cost-effective research capability that includes collaborations among governments, universities, health institutions and industry.

Grains and oilseeds industry

Nearly 40 per cent of the food products Canada exported in 2000 were grains, oilseeds and related products, with an estimated value of \$9.2 billion. The production of grains and oilseeds reached 61.7 million tonnes in 2000–2001.

Canadian agriculture scientists' work on value-added processing has led to the recovery of many important sugars, organic acids and pharmaceuticals from grains—primarily oats. Included in this list are antibacterial compounds, anti-histamines, antioxidants, steroids, vitamin E and anti-cancer agents. This research has also enhanced food and feed ingredients such as surfactants, sugars, sweeteners and emulsifying agents, and cosmetic co-products, such as ultra-violet light barriers, cleansing agents and waxes.



Grain-based products industry

The flour milling industry comprises firms that primarily mill wheat and other cereal grains into flour, feed for animals and other products such as biscuits. The industry exports large quantities of Canadian durum to many countries including Italy, Turkey and the United States.

Canadian agriculture scientists are developing new durum wheat varieties with extra gluten strength to fit the needs of the pasta-making world, and are setting their sights on white wheat that allows millers to extract an additional three to four per cent more flour.

Maple syrup and honey industries

Canada makes 85 per cent of the world's maple syrup. It is the world leader in maple syrup exports, selling more than 25,000 tonnes valued at \$106 million in 2000. There was also an important shift towards value-added products, shipping maple syrup in prepackaged containers and blending it with other products.

The world's sixth largest producer of honey, Canada exported 15,300 tonnes in 2000, mostly to the United States and Germany. Recognized worldwide as being of the highest quality, Canadian-packaged honey is filtered and can be pasteurised, does not need preservatives and has a shelf life of up to two years.



Organic industry

Canada is regarded as an ideal country for producing organic food thanks to its vast size and cold climate, which reduces pests and disease.

Sales of organic products are expected to grow 20 per cent annually and account for 10 per cent of the Canadian retail market by 2010, with retail sales estimated to reach between \$700 million and \$1 billion.

Canada is among the top five producers of organic grains and oilseeds, with 5 per cent of Canadian grain farms reporting themselves as organic.





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Overview of the Sector

Canadian Agriculture: A Growing Sector

As the second-largest country in the world, Canada has the crucial ingredients for leading the world's agriculture trade: a clean environment, temperate climate, plentiful natural resources, a strong economy, and high standards for food inspection and regulation.

Canada's agriculture and agri-food sector is a robust industry that contributes to the economy and quality of life of all Canadians. The third-largest employer, it is one of the country's top five industries and accounts for about 8.3 per cent of the Canadian Gross Domestic Product. And while it is one of the oldest sectors of the economy, deeply rooted in Canadian history and culture, it has also become one of the most dynamic and innovative industries in Canada.

Canada's Commitment: Food Safety and Innovation

Canada's agriculture, food and beverage sector has a reliable, cost-effective and flexible business environment, one that adapts product formulations quickly to meet the needs of buyers, and provides access to abundant supplies of the highest-quality ingredients in the world. All these factors have created an environment that is a catalyst for rapid growth resulting in unequalled value.

But what really makes Canada's agriculture, food and beverage sector excel internationally is its ability to meet the changing demands of food consumers.

In Canada, government is working with industry to build a new architecture for agricultural policy to ensure the sector's success into the 21st century. The objective is to make Canada the world leader in food safety, innovation and environmentally responsible production.



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Full Speed Ahead

The Canadian agriculture and food industry shows no sign of slowing down. In fact, Canada is now considered the investors' gateway to the vast North American Free Trade Agreement (NAFTA) market, featuring a skilled and educated workforce, the lowest business costs in North America and a world-renowned network of R&D clusters. The Government of Canada has helped to improve access to markets as diverse as the United States, Mexico, Europe, Puerto Rico, Korea and South Africa.

All this is supported by Canada's transportation infrastructure—one of the most efficient in the world—that takes advantage of Atlantic, Pacific and Arctic ports, nine major international airports and more than 150 Canada-US border crossings.

With so many advantages, Canada is well positioned to capitalize on further trade liberalization through its active participation in multilateral trade and investment negotiations, including the World Trade Organization, the Free Trade Area of the Americas, the Asia Pacific Economic Cooperation, and the European Free Trade Association.

Planting Seeds Around the World

The sector is continuously growing. In the past decade alone, total exports have doubled and exports of processed food products have more than tripled, now exceeding those of primary food products. Canada exports a wide-range of products to more than 200 trading partners around the world.

In 2000, the total value of Canada's agri-food exports was a record \$23.4 billion, amounting to 6.1 per cent of total merchandise exports.

Value-added and processed goods, together with prime-quality meats, live animals, bulk grains, oilseeds and vegetables are Canada's top agricultural exports. Other important export foods are milk products; fish and seafood; maple syrup and honey; organic, natural and health foods; and confectionaries and beverages.

Turning Innovative Science into Innovative Products

For all sector stakeholders—from primary producers to value-added processors—operating in an increasingly global marketplace requires advanced technology and the latest scientific knowledge that addresses increasingly sophisticated consumer demands.

Canada has internationally recognized expertise in a wide range of scientific and technical areas, including processing and packaging technologies, biotechnology and genomics, and environmental impact. Researchers from federal, provincial and university organizations provide the agriculture and food industry with the knowledge, advice and technology it needs to achieve a balance among economic, social and environmental interests.

Agricultural research has also helped develop farm practices that reduce erosion, use fertilizers and pesticides more efficiently, and provide better ways to manage manure. All this has resulted in cleaner air, water and soil.

Across Canada, federal, provincial, university and industry facilities are grouped together, creating clusters of knowledge and expertise that act as incubation centres for innovation and discovery. Clustering has the advantage of leveraging funding by sharing expertise, facilities and support infrastructure with research partners. Some cluster examples include: Saskatoon, Saskatchewan—Agricultural Biotechnology; London, Ontario—Health Sciences; Guelph, Ontario—Food Pathogens, Pilot Processing Plant, Functional Foods/Neutraceuticals, Molecular/Cellular Biology; and St. Hyacinthe, Quebec—Food Processing, Preservation, Quality, Safety, Bio-ingredients.

R&D for Less

The Matching Investment Initiative (MII) is a key mechanism for increasing market-driven research in Canada.

The goals of the MII complement those of other Canadian programs. For example, Industry Canada and the National Research Council operate Technology Partnerships Canada (TPC) and the Industrial Research Assistance Program (IRAP), respectively. These programs provide repayable contributions to support the downstream stages of research and development. In addition, tax credits for research and development in Canada are among the most attractive of the G8 countries. Together, these advantages could offset up to two-thirds of the initial investment.

Investors' Gateway

The Canadian agriculture and agri-food sector is known as one of the most dynamic and innovative agriculture industries in the world, featuring top-notch management, cutting-edge research, and well-established, predictable regulatory systems.

Canada is increasingly becoming the number one choice for foreign partners and investors. Trade liberalization has resulted in an unprecedented capacity for expansion and innovation, and has made Canada the investors' gateway to the vast NAFTA market and beyond. In addition to access to cost effective, cutting-edge agri-food research, international investors have access to the most favourable tax treatment in the world and highly developed food products and packaging.



Fresh Approach to Food Quality and Safety

Canada's food inspection system is internationally recognized as being among the best in the world—both in terms of ensuring food safety and quality, and in providing a trade-friendly environment. Consumers are more aware of food security, safety and quality, and are demanding more information about how their food is produced. More than ever, consumers want to know that their food is safe and that it has been produced in an environmentally responsible manner.

In Canada, government and industry are working together to establish national food safety systems that will track food from its origins on the farm all the way to the grocery shelf. These will include on-farm food safety systems that protect consumers against food-borne pathogens, and food documentation that gives consumers greater confidence in what they buy and eat. Moreover, widespread adoption of environmentally sensitive production practices, measurable targets, indicators and timetables will provide consumers with the transparency and information they need to feel even more confident in Canadian agricultural products.



Keeping an eye on safety

The Canadian Food Inspection Agency—Canada's quality assurance watchdog—gives Canadian-based food processors a competitive edge. The Agency provides food inspection, product certification, monitoring of imports, and registration and inspection of processing plants

The Agency's inspection and sampling procedures are continually reviewed and refined to reflect the latest scientific information, new inspection technologies, new processes and products, and new approaches to food safety. It also ensures consistency with other agencies and international requirements. In addition, effective risk management and HACCP-based (Hazard Analysis Critical Control Point) inspection systems facilitate safe products and access to North American and world markets.

Innovative Trade and Marketing Programs

Quick and easy access to federal trade and market development programs, and practical trade regulation procedures and infrastructure, are key to the success of the Canadian agriculture, food and beverage industry. Here too, with its Agri-Food Trade Service (ATS), Canada leads the world.

The ATS assists international business development in Canada. It has become a focal point for Canadian agri-food exporters, simplifying access to international market information and intelligence, proving trade and investment counselling and advice, and initiating export support programs.

You can visit the ATS at <http://ats.agr.ca>.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Buckwheat Industry

Buckwheat is one of the best sources of high-quality, easily digestible protein in the plant kingdom. It is also very high in carbohydrates as well as in numerous minerals and vitamins. This makes buckwheat an ideal ingredient for a wide range of food and non-food products. Buckwheat can either be milled into flour or processed into groats and grits. The groats and grits can be eaten roasted or plain, while the roasted groats may be used as a meat extender or as an ingredient in breakfast cereals and soups. In Japan, buckwheat flour is mixed with other varieties to produce "Soba" noodles, a traditional dish. In North America, buckwheat is also used in the chocolate bar and snack food industries.

Buckwheat is a well-established crop in Canada, and has been grown on the eastern prairies for the last 40 years. Value-added activities and secondary processing of buckwheat are on the rise. Agriculture and Agri-Food Canada has focused its buckwheat research on determining the crop's functionality and devising an integrated preparation process to generate added value for the food and non-food sectors. The buckwheat industry - especially Mancan Genetics and Kade Research in Morden Manitoba - is currently working to develop uniquely Canadian frost-resistant buckwheat and a new variety with high starch content. These newer varieties are expected to join Canadian-developed AC Manisoba and Koban in replacing the traditional Mancan and Manor buckwheat varieties.

The first large-seeded buckwheat variety, Koto, is of interest to millers due to increased starch content and soft starch characteristics. Koto was released in 1998 and began to be commercially produced in Canada in the summer of 2000.

The pharmaceutical and nutraceutical industries are undertaking innovative research into the potential use of buckwheat for lowering cholesterol and fighting



diabetes. The crop's nectar is also used to make honey, and aspirated buckwheat hulls offer an interesting pillow stuffer alternative to consumers allergic to feathers, dust and pollen.

From 1996 to 1998, approximately one half of all Canadian buckwheat was used domestically. Since 1998, exports have exceeded domestic use. In 2001, due to bad weather affecting most of the crops in the Prairies, exports decreased to 7,267 tonnes, 25 per cent below 2000 levels. Despite the low production, exports still account for 57 per cent of total Canadian buckwheat production. This upward trend is expected to continue in the longer term as a result of new seed varieties and the planned launch of a North American campaign promoting buckwheat.

Canada



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Additional information

Despite its name, buckwheat (*Fagopyrum esculentum*) is not a cereal grain, but a fruit or nut. This broad leaf plant includes 18 recognized natural species as well as two man-made species.

Japan is the largest export market for Canadian buckwheat, accounting for roughly 45 percent of total Canadian buckwheat exports in 2001. The next largest market is the United States, which imported around 54 per cent of Canadian buckwheat in 2001. In the United States, buckwheat is used to produce chocolate bars and snack foods.

The International Symposium on Buckwheat is held every two years, bringing together leading international researchers, policy makers and scientists to improve research on cultivation, manufacturing techniques, processing and marketing.

For more detailed information

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Further information on products, suppliers and investment opportunities in the Canadian agri-food industry is available on the Agri-Food Trade Service Web site at: <http://ats.agr.ca>.

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Fax: (204) 925-3785

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Canada's Agriculture, Food and Forestry INDUSTRY

Canada's Poultry Industry



Canada's poultry industry is diverse, efficient and competitive. It includes chicken and turkey meat and edible by-products, as well as ducks and geese. Increasingly, the industry has been turning to less traditional birds. For example, ostriches, emus and rheas are raised for their red-coloured meat, their hide and feathers, and their oils (used in the cosmetics industry).

Came birds such as pheasant, partridge, guinea fowl, quail and squab are also raised commercially in Canada. This sector is well established and growing, and exports of these birds are small but consistent.

Canada exports a wide range of poultry and poultry products to more than 60 countries. Canada can also provide halal-certified, kosher and a wide range of organic meat and poultry products.

In addition to the almost 5,000 commercial poultry and egg producers in Canada, there are a large number of businesses associated with these production activities: 109 hatcheries, 119 feed manufacturers, 82 feed supplement suppliers and 44 drug suppliers.

Poultry production and processing are among the most highly mechanized sectors in agriculture. One person can operate a unit of 50,000 broiler chickens, which, with seven lots per year, will provide 640 tonnes of meat annually. Poultry processing plants in Canada are effectively mechanized, which allows them to slaughter and prepare 25,000 broiler chickens for market per hour.

Getting the bird from the producer to the grocery store requires coordination and cooperation among producers, provincial and federal governments, inspectors, processors and distributors. A well-organized supply management system helps in this regard. Three poultry producers' organisations—the Chicken Farmers of Canada, the Canadian Turkey Marketing Agency, and the Canadian Broiler Hatching Egg Marketing Agency—enable producers to receive their cost of production plus a reasonable rate of return on their investment while ensuring that consumers have a constant supply at stable prices.

In Canada, Hazard Analysis Critical Control Point programs are in place from "farm to plate" to ensure safe food production.





Additional information

In 2000, 2,800 regulated chicken producers and 546 registered turkey producers in Canada produced poultry products worth \$1.6 billion, contributing 5 per cent of cash receipts to farming operations. Canada's commercial chicken and turkey meat production totalled 1,029.7 million kilograms, and the country produced 877,280 tonnes of chicken, more than half of which was produced in Quebec and Ontario.

In 2000, Canada exported almost 12 million chicks, domestic fowl, turkeys, poults (young turkeys), ducks, geese and guinea fowl worth \$35.4 million to 20 countries, including the United States, the Philippines, Saudi Arabia, Tunisia, Israel and France.

Canada also exported more than 81 million kilograms of poultry meat and edible by-products (fresh, chilled, frozen) worth more than \$118 million to 62 countries, including the United States, Cuba, China and Hong Kong, South Africa, the Philippines, Russia, Poland, Jamaica and Peru.

For more detailed information

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Red Meat Industry

Canada's red meat and meat products industry includes beef, pork and lamb, but also venison and bison. With annual shipments worth \$11.3 billion in 2000, it is the largest sector of the Canadian food manufacturing industry. In 1999, the industry placed fourth among Canada's leading manufacturing industries.

Canada's meat processing companies make a wide variety of meat products, ranging from fresh or frozen meat to processed, smoked, canned and cooked meats, as well as sausage and deli meats. About 70 per cent of processed meats in Canada, such as sausages or cold cuts, are made with pork.

The high quality and consistent safety of Canadian red meat and meat products is well established in many countries. The Canadian Food Inspection Agency (CFIA) works with the industry to maintain and enhance this reputation. The CFIA inspects imports and federally registered establishments that produce processed meats and ready-to-eat products to verify compliance with food safety regulations.

Since 1990, red meat and live animal exports have increased from \$1.9 billion to \$5.3 billion in 2000. From 1996 to 2000, red meat exports nearly doubled.

In 2000, there were:

- 12.8 million cattle and calves on 121,375 ranches, earning farm cash receipts of \$6.6 billion.
- 12.2 million hogs on 13,500 farms, earning farm cash receipts of \$3.4 billion (from the sale of slaughter hogs).



- 978,500 sheep and lambs on approximately 10,000 farms, earning farm cash receipts of \$79 million.
- 122,000 heads of elk, fallow deer, white-tailed deer and other venison species on about 2,000 farms, with a total industry value of approximately \$207 million.
- 120,000 bison on about 1,400 farms, with an industry value of approximately \$100 million.

In addition to its red meat exports, Canada can provide halal-certified, kosher and a wide range of organic meat and poultry products, as well as game meat such as elk or bison.

Additional information

In 2000, Canada exported 446,288 tonnes of beef and beef products valued at \$1.9 billion, mainly to the United States and Japan but also to Mexico, South Korea, Taiwan and Hong Kong.

In 2000, 19.4 million pigs went to market. Almost one quarter of these went to the United States as live pigs, while the rest were sent to 100 slaughtering plants in Canada.

Pork exports increased to 635,116 tonnes in 2000, up 22 per cent from 1999. Sales to the United States increased 21 per cent to 348,423 tonnes, while sales to Japan rose 37 per cent to 114,962 tonnes. Processed pork sales totalled an estimated 76,473 tonnes, with the United States being the dominant purchaser, followed by Japan, Cuba and Russia.

The cattle sector is concentrated in Alberta (40 per cent of total inventory), while sheep production is located mostly in Alberta, Ontario and Quebec (70 per cent).

The bison sector has experienced continued growth since 1994; this growth is expected to continue.

For more detailed information

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Canada's Alcoholic Beverages Industry

The great success of the Canadian alcoholic beverages industry can be attributed to a ready supply of high-quality raw ingredients, innovative processing and brewing techniques, and the right climate.

Canada's distilled spirits industry is perhaps best known internationally for Canadian whiskey, or rye, our most popular domestic and exported distilled spirit. Canadian distillers manufacture spirits using readily available Canadian grains and potatoes and, in the case of liqueurs, fruits and nuts.

In 2000, Canada exported more than \$1 billion in distilled spirits, beer and wine. Distilled spirits exports totalled nearly \$655 million, beer exports were valued at over \$326 million, and wine exports totalled more than \$80 million. Of the wine exports, over \$70 million was other than grape wines, including fermented beverages, cider, fruit wines, perry, mead and hard lemonades.

Canadian wines are gaining a strong reputation in Canada and abroad. Canadian Icewine, for example, is a sweet dessert wine that is celebrated around the world for its quality and has won several of the highest and most prestigious awards at international competitions.

Canadian Icewine relies on high-quality grapes grown in a cool climate to produce its unique characteristics.

Wines produced under the Vintners Quality Alliance (VQA) banner must meet strict quality standards. Canadian vintners grow primarily quality *Vitis Vinifera* and hybrid grape varieties. Many of the *Labrusca* grapes have been replaced with the *Vinifera* varieties (such as Chardonnay, Riesling, Merlot, Pinot Noir, Cabernet Sauvignon), allowing Canadian wineries to compete successfully with European wines in terms of quality.



Canadian malting barley, which is very high in quality, is in demand by brewers around the world. Canada supplies about 30 per cent of the world's barley.

Innovative products, such as low-alcohol beverages, wine coolers, fruit wine coolers and hard lemonade, and ales, are gaining in popularity, both in Canada and abroad.

Additional information

There are 627 domestic spirit brands and 2,608 imported spirit brands available in Canada, excluding coolers. In terms of value, Canada exports almost twice as much spirits (primarily Canadian whiskey) as it imports.

Each year, the brewing industry spends about \$780 million on domestic materials and supplies, including barley malt, bottles, cans and kegs, cartons and labels, and other materials and supplies. Over 97 per cent of the beer consumed in Canada is produced in Canada—a testament to its taste and quality and to the sector's



success in establishing licensing agreements with foreign beer companies. In 1999, Canada was the world's seventh largest exporter of beer.

Agriculture and Agri-Food Canada supports Canada's alcoholic beverages industry through research into the development of new varieties of grain, and new methods, tests and procedures to improve production. It also monitors quality.

Health Canada regulates the contents of all alcoholic beverages through the *Food and Drugs Act*, while the Canadian Food Inspection Agency monitors domestic and imported alcohol products for compliance with net quantity, label and container regulations.



For more detailed information

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Canary Seed Industry

Canada is the world's number one producer and exporter of canary seed, a cool-season crop grown in Saskatchewan and other parts of western Canada. Native to southern Europe and the Middle East, this metre-tall grass is a major component of feed mixtures for caged and wild birds. Canary seed is currently used almost exclusively as birdseed.

Traditionally, the two registered canary seed varieties produced in Canada are Keet and Elias. However, Canada recently developed a new glabrous (hairless) kind of canary seed registered under the trademark Canario.

Canario is expected to replace traditional canary seed over the next few years, because it maintains the high protein of regular canary seed, while being less irritating to the skin during handling. This makes it the perfect option for birdseed processors and packagers. It will also further enhance Canada's competitive edge in the canary seed market by increasing the volume of seed per shipping container and elimination of the oiling and polishing steps in processing.

New Canario varieties are subject to strict quality standards. Based on commercial pedigreed seed standards, Canario varieties must be 97 per cent hairless in order to bear the Canario trademark, which is the processor's guarantee of purity.

As populations and incomes continue to grow, and as more and more people around the world are keeping birds as pets, the demand for canary seed looks strong.

Canadian researchers are exploring the possibility of extending the use of canary seed to human consumption. Because of its high protein, high oil and high unsaturated fat content, the seed has good potential as human food. It could be used in multigrain bread and in condiments, and has the potential as a fat substitute



because of its high (84 per cent) unsaturated edible oil content. In addition, canary seed has a high starch content making it suitable for some industrial uses, such as the cosmetics sector.

This penetration into human consumption and industrial use markets is expected to increase dramatically the demand for Canadian canary seed over the next decade.

Additional information

Approximately 88 per cent of Canadian canary seed production is exported, mostly to Mexico and Belgium.



Internationally, Canada accounts for about three quarters of the total world canary seed production. Saskatchewan is the source of approximately 85 per cent of total Canadian production, while Manitoba and Alberta produce the remainder of canary seed.

Due to bad weather conditions in 2001, canary seed harvested area decreased by 14 per cent from 2000, from 164,000 hectares to 140,000 hectares. Crop yield decreased by 36 per cent, from 1.04 tonnes per hectare in 2000 to 0.66 tonnes per hectare in 2001. Despite this lower production, exports have increased by 5 per cent to reach 165,000 tonnes. In 2002, harvested areas are expected to increase by more than 50 per cent to reach 215,000 hectares.

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Canada's objective is to be the world leader in food safety, innovation, and environmentally responsible production and to be the best at meeting the needs of consumers at home and abroad.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Confectionery and Chewing Gum Industry

The confectionery industry in Canada includes manufacturers of all types of sugar confectionery, chocolates and other cocoa-based products, as well as producers of chewing gum.

The industry has two major subsectors: sugar and chocolate confectionery, which accounts for about 80 per cent of industry shipments, and chewing gum, which accounts for almost 20 per cent of shipments.

Most chocolate operations are large and dedicated to two major products: boxed chocolates and chocolate bars. Most boxed or packaged chocolates are sold as gifts for special occasions. The chocolate bar market tends to be steady year-round but is highly fragmented. A chocolate bar that can capture 4 to 5 per cent of the market is considered successful. Most of the top 10 brands in the bar market in Canada today have been among the top 10 for close to 60 years.

Most sugar confectionery companies are small or mid-sized and produce a wide variety of products, such as hard candy, gummy bears, licorice, jujubes and toffee, as well as an assortment of hard and soft candies for specialty and novelty markets.

Chocolate bars are the major products in the sugar and chocolate confectionery subsector, followed by boxed and bulk chocolates, and hard, medium and soft candies.



Foreign ownership of the confectionery industry is high. Foreign-controlled enterprises located in Canada account for an estimated 60 per cent of industry shipments. Many major Canadian companies are recognizable subsidiaries of foreign-based multinationals, including Cadbury, Effem Foods (parent is Mars Inc.), Hershey, Nestlé, Warner-Lambert and Wrigley.

Firms in the confectionery industry compete on the basis of brand name, product advertising and promotion, specialty products, quality and cost of production. Because confectionery products are usually discretionary and high-impulse purchases, promotion plays a substantial role in establishing brand-name presence in the various regional markets of Canada.

Packaging materials represent a significant input cost, estimated at more than 23 per cent of the cost of raw materials. The primary ingredients used, and the approximate percentage cost of raw materials, are cocoa products (23 per cent), sugar (8 per cent), dairy products (5 to 6 per cent) and nuts (5 to 6 per cent).

Sugar-free confectionery is one of the fastest growing market segments. Newly developed blended ingredients and sweetener systems are allowing manufacturers greater diversity and stability in the finished product, as well as additional ease of manufacture. Synergy among many of these products has resulted in better taste and texture.



Confectionery products, whether produced in Canada or imported, are subject to the Food and Drugs Act and Regulations, which are enforced by the Canadian Food Inspection Agency (CFIA). CFIA inspectors check to see that producers and packagers conform to very specific regulations about the labels they put on their products.

Additional information

In 1998, the confectionery and chewing gum industry had 91 establishments, employed 10,279 people and manufactured products (own manufacturing) valued at \$2.9 billion.

Food and beverage processing is the second-largest manufacturing sector in Canada in terms of both shipments (\$59.4 billion in 1998) and employment (227,220 people in 1998).

In 2000, Canada exported \$943.2 million worth of confectionery products. The leading eight confectionery enterprises produce about 87 per cent of the value of shipments.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Dairy Industry

Canadian milk and dairy products are recognized internationally for their superior quality. Strict quality standards at both the farm and processing levels contribute to this reputation.

Next to grains and livestock, dairy is Canada's most important agriculture sector, with net farm cash receipts of \$4.1 billion in 2000. Nearly 26,000 people work on dairy farms and more than 20,000 others work at the primary processing level.

Canada exports higher-value dairy products such as aged cheddar cheese, some of the finest specialty cheeses, ice cream and dairy beverages to traditional and new markets. Canada also exports easily stored products such as butter, milk powders, and condensed

and evaporated milk to developing countries. In the 2000–2001 dairy year, exports totalled close to \$395 million.

Canada also imports dairy products, \$510 million worth in the 2000–2001 dairy year. Cheeses were the major import. The European Union is Canada's main supplier of imported dairy products, followed by the United States and New Zealand.

The Canadian dairy sector has developed a cattle population of the highest genetic level in the world. This is based on strong milk recording and genetic evaluation programs, which have been in place in Canada since 1905. Canadian dairy cattle, recognized for their ability to produce high quantities of milk over many lactations, are exported to more than 50 countries. Exports of Canadian dairy genetic material are valued at more than \$128 million annually. Major export markets include the United States, Mexico, the European Union, Japan, South America, Australia and the Middle East. Canada is free of all major cattle diseases, mostly due to its strict standards for disease control, which is the responsibility of the Canadian Food Inspection Agency.

The industry has excellent research and development capabilities, both at the production and processing levels. Impressive research facilities (government, universities and private-sector) contribute to the long-term competitiveness of the sector—as well as the safety and quality of dairy products—through the development and transfer of innovative technologies.

Canada's dairy sector functions under a supply management policy framework. This orderly marketing system is designed to encourage the production of sufficient volumes of industrial milk and cream to meet domestic demand for dairy products as well as certain planned exports.

The Canadian Dairy Commission and Agriculture and Agri-Food Canada, in partnership with producer associations such as the Dairy Farmers of Canada and dairy processors' organizations such as provincial dairy councils, play a key role in helping ensure that the Canadian dairy industry remains strong and dynamic.



Additional information

There are two markets for domestic milk in Canada: the fluid market (table milk and fresh cream) and the industrial market (manufactured dairy products such as butter, cheese, yogurt and ice cream).

About 80 per cent of Canada's dairy farms are in Ontario and Quebec; the rest are in the Western provinces and Atlantic provinces.

In the 2000–2001 dairy year, 1.16 million cows on 19,411 dairy farms produced 75.1 million hectolitres of milk.

In 2000, dairy products shipped from approximately 281 processing plants were valued at \$9.8 billion, accounting for 14.3 per cent of all processing sales in the food and beverage industry in Canada.

In the 2000–2001 dairy year, Canadian cheddar cheese production continued its growth to 123,457 tonnes. Specialty cheese production decreased slightly to 201,028 tonnes. Mozzarella led the way, accounting for 59 per cent of total specialty cheese production. Overall, Canada produces more than 300 different varieties of fine cheeses including raw milk cheeses and goat and sheep cheeses. Butter production totalled 81,002 tonnes.

In 2000, Canada produced 416 million litres of ice cream and ice cream products (hard and soft ice creams and ice cream mixes) and 6.1 million litres of frozen yogurt. Yogurt production continued to grow, totalling 50 million kilograms.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Egg Industry

Each year in Canada, more than 24 million hens lay over 6.5 billion eggs. About 5.3 billion of these are sold as table eggs, while the rest are processed into liquid, frozen or dried form.

Over the years, a combination of research, innovation, regulation, equipment and technology have guided the development of the egg processing industry in Canada. Canadian egg products are now recognized internationally for their superior quality.

The most popular breed of chicken for egg production in Canada is the White Leghorn. The average Canadian flock size is 16,000 hens, but five farms in Canada have flocks larger than 100,000 hens. The average laying hen produces about 285 eggs per year.

In the last two decades, as demand for easy-to-use ingredients has increased, the processed egg industry has expanded steadily. Exports of processed eggs and the number of countries they are shipped to have more than doubled since 1990. Only a few preserved shell eggs are exported.

Egg processing includes the production of whole egg, albumen and egg yolks in frozen, dried or liquid form. Processed eggs are used in the manufacturing of many foods, including mayonnaise, noodles and baked goods. They are also used to make other items such as shampoo, pet foods and adhesives.

Important biochemicals are also derived from eggs, including avidin and ovomucoid, two highly purified proteins used in various tests for drugs such as cocaine and marijuana in blood and urine. In addition, ovalbumin and conalbumin are used in geriatric feeding formulas.

In 2000, total farm gate value of eggs was \$676 million. The value of 2000 sales from the entire Canadian egg processing industry is estimated at \$100 million (not including the value of biochemicals extracted from eggs for use in pharmaceuticals).

In 2000, there were 1,147 registered commercial egg producers in Canada. Ontario produced 37.7 per cent of all eggs in Canada, while Quebec produced 17.9 per cent. The western provinces have a combined egg production of 36.9 per cent and the eastern provinces have a combined production of 7.4 per cent.





Canada's egg industry operates under an orderly marketing policy framework that is designed to encourage production of a sufficient volume of eggs to meet market needs. Getting the eggs and processed eggs from the producer to the grocery store requires coordination and cooperation among producers, egg graders, processors, provincial and federal governments, inspectors, distributors and retailers.

Canadian Food Inspection Agency inspectors across Canada monitor operations and take random food samples from egg grading and egg processing stations for laboratory analysis to verify compliance with food safety regulations and product standards. In addition, the Canadian Egg Marketing Agency has voluntary on-farm safety programs that are monitored by its inspectors.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Fish and Seafood Industry

Canada is one of the foremost maritime nations in the world. Surrounded by the Arctic, Atlantic and Pacific Oceans and home to the Great Lakes, Canada boasts the world's longest coastline. With more than 755,000 km² of freshwater, Canada has 16 per cent of the world's area of freshwater and 4 of the 14 largest lakes in the world.

Canada has one of the world's most valuable commercial fishing industries, worth almost \$5 billion a year. The safety and high quality of Canadian fish and seafood products are recognized in more than 80 countries. Canada exports over 75 per cent of its fish and seafood production.

In 2000, Canada exported 495,976 tonnes of seafood and seafood products valued at more than \$4 billion. Most of this went to the United States, followed by Japan and the European Union. Canada imported \$2.08 billion worth of fish and seafood products in 2000, resulting in a trade surplus of nearly \$2 billion. Almost 32 per cent of the volume (and 4 per cent of



Canada



<http://ats.agr.ca>

the value) of imports were products not for human consumption, mostly meal used in the manufacture of livestock and fish feed.

Both segments of this industry—the capture fishing industry and aquaculture—operate in three broad regions (Atlantic, Pacific and freshwater). In 2000, the capture fishing industry had total landings of more than 1 million tonnes valued at more than \$2 billion. By volume, the Atlantic fishery accounted for 82 per cent of total landings, the Pacific fishery for 14 per cent, and the freshwater fishery for 4 per cent.

- In the Atlantic fishery, top catches were herring (harvested for its roe), shrimp, snow crab, scallops, cod and lobster. The other value leaders in 2000 were crab, shrimp and cod. Lobster continues to be Canada's most valuable seafood product, worth \$509 million in 2000.
- In the Pacific fishery, top catches were hake, Pacific herring (harvested for roe), rockfish and salmon. Value leaders were clams, halibut, shrimp, rockfish and salmon.
- Top freshwater catches included pickerel, yellow perch, whitefish, northern pike and lake trout, valued at almost \$77 million in 2000.

Aquaculture production is becoming increasingly important in Canada. In 2000, aquaculture industries produced 124,000 tonnes of fish and shellfish worth a record \$611.6 million, and accounted for 10 per cent of the total Canadian production of fish and shellfish.

- Canada is one of the world's key suppliers of farmed salmon (Atlantic, chinook and coho). Trout, steelhead and Arctic char are also cultured.
- Shellfish farming is gaining prominence. Prince Edward Island's cultured mussels are known around the world, as is the repe-growing technology that developed them. Oysters (Atlantic, Pacific and European), manila clams and scallops are also gaining prominence.

During the 1990s, the industry responded to downturns in the Atlantic groundfish and Pacific salmon fisheries by becoming more competitive. In addition, Fisheries and Oceans Canada has worked to secure the future of Canada's wild fisheries by initiating conservative management practices that focus on sustainable development and responsible fishing.

Additional information

Fisheries and Oceans Canada regulates and manages the Canadian fish and seafood industry, while Agriculture and Agri-Food Canada is responsible for marketing and trade development.

The Canadian Food Inspection Agency (CFIA) sets the policies, requirements and inspection standards for fish products, federally registered fish and seafood processing establishments, importers, fishing vessels, and equipment used for handling, transporting and storing fish. Safety and quality are assured through the Quality Management Program (QMP), Canada's comprehensive fish-inspection system based on Hazard Analysis Critical Control Points (HACCP) principles.

The CFIA's export certification program provides exporters with official documentation that Canadian fish and seafood products sold on the international market will be acceptable to importing countries.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Floriculture, Nursery and Christmas Tree Industries

Canada's floriculture, nursery and Christmas tree industries have grown steadily in recent years and now represent almost 13 per cent of cash receipts from all crop sales.

In 2000, Canada exported \$409 million worth of floriculture and nursery products to 37 countries, mostly live plants, and cut flowers, flower buds, foliage and branches for bouquets or ornamental purposes. Bilateral and multilateral trade agreements such as those in place with the United States, Mexico, Israel, Chile and Costa Rica continue to have a positive impact on exports, which have surpassed imports since 1997.

Ongoing research ensures a wide and widening variety of floral products available for domestic and international customers, as well as improved crop yields and quality in general. Currently, the main varieties of cut flowers produced in Canada are roses, tulips, chrysanthemums, gerberas, lilies, alstroemeria and snapdragons. The main potted plants produced are geraniums, chrysanthemums, poinsettias and tropical plants (including foliage and green plants).



Photo courtesy of the Drysdale Tree Farm / Christmas Tree Farmers of Ontario

The Canadian nursery industry has developed the Canadian Nursery Certification Program and the Canadian Greenhouse Certification Program to facilitate the import and export of potted flowering plants between the United States and Canada. Canadian technology, along with the advantage of being able to supply tested winter-hardy stock, gives Canadian producers a strong advantage over stock produced in warmer climates.

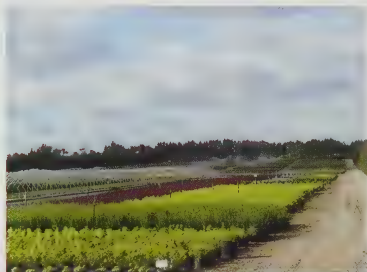
In 2000, Canada exported 2.5 million Christmas trees. Major importers of Canadian Christmas trees know that Canadians do not sell what they produce but rather produce what the client wants. Buyers of Canadian Christmas trees have discovered the beauty, warmth and fragrance of a real tree grown in a non-polluted and cold winter environment.

In particular, most importers of Canadian Christmas trees appreciate the balsam fir and the Fraser fir's durability, colour and unique fragrances. Trees are pruned annually to hold back the upward growth, which allows them to branch more quickly and gradually achieve the full bushy appearance consumers look for in a Christmas tree. Choosing a Canadian-grown tree is a cherished tradition of millions of people around the world.

The floriculture, nursery and Christmas tree industries are regulated under the *Plant Breeders Rights Act*, the *Pest Control Products Act*, the *Plant Protection Act*, and the *Wildlife and Plant Protection and Regulation of International and Interprovincial Trade Act*.

Growers in Canada are represented by four national organizations:

- Flowers Canada www.flowerscanada.ca/
- Canadian Horticultural Council www.hortcouncil.ca/
- Canadian Nursery Landscape Association www.canadanursery.com/
- Canadian Christmas Tree Growers Association www.christmastree.net/



Other links

Landscape Ontario Horticultural Trade Association
www.hort-trades.com/

The B.C. United Flower Growers Co-operative
Association www.ufgca.com/

Canadian Food Inspection Agency
www.inspection.gc.ca/

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Canada's Forage Industry

Forages are any plants consumed by livestock. They include pasture and browse plants, baled hay, silage, alfalfa pellets and cubes, immature cereals, as well as grain residues. As well as being the basis of Canada's large livestock industry, forages are very important in soil conservation—they are used in crop rotation to improve soil structure and add nitrogen to the soil.

Throughout Canada, more than 26 million hectares are devoted annually for livestock grazing and forage production. Of this, about 16 million hectares are native pasture, 4 million hectares are tame or seeded pasture, and 6 million hectares are cultivated tame hay and fodder crops. In total, it is estimated that around 40 per cent of Canada's total farm area is allocated for grazing and growing forage crops.

Two forage processing industries, alfalfa dehydration and hay compaction, contribute to sustaining a dynamic and diverse forage sector in Canada. These industries are highly export oriented. Processed products include dehydrated alfalfa meal and pellets, sun-cured alfalfa pellets, alfalfa cubes and compressed bales of timothy, alfalfa or mixed hay.

Alfalfa is considered the queen of forage and is the most widely grown forage legume in Canada. Recognized around the world as premium forage for dairy cattle and horses, in Canada alfalfa is often grown as hay, in combination with grasses such as timothy or brome. It will grow under most conditions and, depending on the variety of alfalfa chosen, can be adapted to a host of climatic regions.

The Canadian alfalfa processing industry, also known as the dehydration industry, has gradually matured over the past four decades to become the world's



largest exporter of alfalfa pellets and the second-largest exporter of alfalfa cubes. The industry produces 350,000 tonnes of alfalfa pellets and 225,000 tonnes of alfalfa cubes annually.

Canada's compressed (or double-compressed) hay industry, first established in the mid-1980s, uses hydraulic pressure to compress field hay bales into bales less than half their original size. Access to irrigation and climatic conditions at the foothills of Canadian Rockies, and better access to the West Coast export terminals, make Alberta a choice location for hay production and processing activities. The industry has experienced significant growth in the last four years. The industry processes 260,000 tonnes of hay annually.

Additional information

Most forage species are in the grass and legume families. The widely grown grass species in Canada include timothy, brome grass and the fescues, while the main legume species include alfalfa and red clover.

Forage processing activities are concentrated in the Canadian Prairies, with some extending to Ontario, Quebec and New Brunswick.

The forage processing industries are highly export oriented. The Canadian dehydration industry generates nearly \$100 million in exports, while the compressed hay industry generates \$86 million annually. Japan, South Korea, the United States and Taiwan are the primary markets for Canadian forage products.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Fruit Industry

Canada is a world leader in producing, storing and processing a wide variety of fruits in innovative and environmentally responsible ways. Increased consumer awareness of the health benefits of eating fruits and vegetables has contributed to an increase in consumption in recent years.

Fruits have a variety of end uses. They can be enjoyed fresh or processed for use as juice, sauces, wines, ciders, dried fruit or jams and jellies. Fruits can be dried, canned or frozen for preservation. Many are used by the bakery trade and by ice cream and yogurt manufacturers.

Many fruits are also used in flavourings, oils, dyes and cosmetics.

In 2000, Canada produced 794,000 tonnes of fruit, worth about \$510 million at the farm gate. Exports of fruits reached \$269 million in 2000. Between 1990 and 2000, exports of fresh fruit more than doubled to \$131 million.

In 2000, Canada exported:

- \$90.3 million worth of frozen wild blueberries and \$29.7 million worth of cultivated blueberries;
- 40,548 tonnes of cranberries; and
- \$53.8 million worth of fresh apples.

There are about 16,300 fruit growers in Canada; about 20 per cent of these growers account for 80 per cent of Canada's production. Apples by far account for the largest production, followed by blueberries, grapes, cranberries, peaches, strawberries and raspberries.



The Canadian fruit industry has adapted to Canada's cool northern climate and short growing season. It has become a world leader in improving farm management and storage techniques. Canadian apples, for example, can be supplied virtually year-round using controlled atmosphere storage.

As well, Canadian scientists continually develop and enhance technology such as plant breeding to maximize production. In the last decade, a number of new fruit varieties and production techniques have been adapted to the Canadian climate. For example, Vinifera grapes, used in wine making, are doing very well and, as a result, have created a boom in the Canadian wine industry. New varieties of peaches, cherries, blueberries, raspberries, strawberries, kiwis, blackberries, currants and gooseberries have also been developed through breeding programs.

Pesticide use in Canada is already significantly lower than in many countries, due in part to our climate. However, in response to consumer demand for reduced pesticide use, scientists are working to find alternative ways to control pests and diseases. More producers are using integrated pest management programs, where pest populations are closely monitored and pesticides are precisely timed and applied to maximise effectiveness and minimise usage.





Additional information

A number of fruits are native to Canada, including cranberries, blueberries, strawberries, raspberries, blackberries, black raspberries, saskatoons and the labrusca grape.

Southern Ontario and southwest British Columbia have the longest growing seasons, with about 180 frost-free days per year. Regions of Quebec and the Maritimes also have significant fruit production despite having only about 120 frost-free days.

Apples are Canada's largest fruit crop, with about 542,859 tonnes grown in 2000. Commercial apple production was worth an estimated \$186 million at the farm gate in 2000. About two thirds of Canada's apples were shipped fresh, while the rest went to processing markets for uses ranging from pressing for juices and ciders to peeling and slicing for the canning and baking industries.

Canada is the world's largest producer of wild blueberries, with 37,000 tonnes produced in 2000, worth almost \$57 million at the farm gate.

Most fresh fruit is handpicked to reduce bruising. However, sour cherries, blueberries, grapes and cranberries are harvested mechanically.

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Canada's objective is to be the world leader in food safety, innovation, and environmentally responsible production and to be the best at meeting the needs of consumers at home and abroad.



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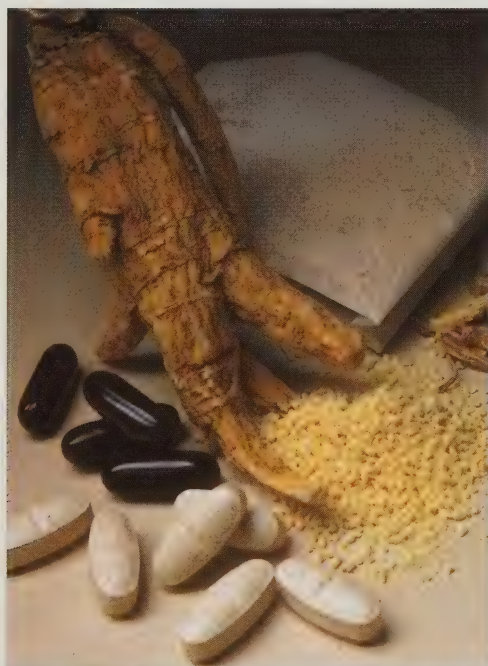
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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Functional Foods and Nutraceuticals Industry

The new and emerging market for nutraceuticals and functional foods—natural, bioactive chemical compounds with health-promoting, disease-preventing or medicinal properties—is driven by an increasing consumer understanding of the link between diet and disease, aging populations, rising health-care costs, and advances in food technology and nutrition research.



Canada is well positioned to become a leading supplier of nutraceuticals and functional foods to the world. In addition to an excellent international reputation for a pure, clean environment and resulting safe, high-quality food products, Canada has a strong, cost-effective research capability that includes collaborations among governments, universities, health institutions and industry.

The industry estimates that the global market for functional foods and nutraceuticals is growing faster than the processed food market as a whole, especially in Canada, the United States, Japan and Europe. The value of the functional foods and nutraceutical global market could reach as much as \$51 billion by 2003.

Stakeholders across Canada are seizing opportunities in this industry. Canadian researchers have special expertise in improving the nutritive value and functional properties of various crops. Many Canadian farmers are diversifying crop production by experimenting with herbs, flax and borage, for example. In addition, there has been a trend towards value-added processing and extracting nutritionally valuable constituents such as phytonutrients and essential fatty acids. All of this is leading to direct health benefits for consumers.

The federal government continues to support innovation and the development of new technologies in agriculture, agri-food and natural resources. The Canadian Institutes of Health Research, National Centres of Excellence and Canadian Foundation for Innovation all fund research.

Canada's active, research-oriented industry includes more than 200 food, nutraceutical and pharmaceutical companies. Major multinational corporations such as Kellogg's, Heinz, Quaker, Unilever, Dupont, Novartis, Cargill, Hormel, Abbott Laboratories and Royal Numico are also active in this sector.

Canada's inspection system is highly regarded internationally. Health Canada has proposed regulations on health claims for foods. It has established a new Natural Health Products Division to develop a new regulatory framework for natural health products (including nutraceuticals). The goal is to protect the health of consumers while affording them choice and access to products.

Canada's business climate fosters investment in such areas as biotechnology and functional foods by forming "clusters," or geographic concentrations of interconnected companies and institutions in a particular field, such as suppliers of specialized inputs, providers of specialized infrastructure, downstream channels and customers, manufacturers of complementary products, companies in related industries, governmental and other institutions.

Moreover, some government market and export development programs exist and, through Team Canada, Canada is stepping up its trade promotion activities in strategic sectors such as biotechnology, environmental and information technology and health.

The Canadian industry is beginning to organize a Canadian Nutraceutical and Functional Food Alliance, a national, non-profit federation of regional nodes and sectoral organizations dedicated to improving human health through the development of a science-based, profitable functional food and nutraceutical industry.

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Canada's Agriculture, Food and Forestry INDUSTRY

Canada's Grain-Based Products Industry

Canada's grain-based products industry is large and diverse. It includes flour milling, pasta, baking, biscuit and cereal manufacturing sectors that make a wide range of products. This industry is efficient and competitive, thanks to ongoing innovations in wheat varieties and processing technology.

The flour milling industry includes firms that primarily mill wheat and other cereal grains into flour, feed for animals, and other products. Some firms also blend flour into bakery mixes. The industry is closely linked with the baking, biscuit and breakfast cereal manufacturing industries, which collectively use more than 50 per cent of all milled cereal products consumed in Canada.

Canada produces an abundance of durum wheat, which, when milled into semolina flour, is the primary ingredient in pasta. Pasta is easy to prepare, versatile and an excellent value. It is also rich in proteins, high in minerals such as iron, phosphorous and vitamins, and very easily digested. Canada exports durum to many of the world's top pasta producers, such as Italy and Turkey.

The dry pasta industry in Canada is focused on the manufacturing of heat-based products often referred to as long goods or short goods depending on their shape. Long goods, often referred to as vermicelli, include spaghetti, capilli, linguini, vermicelli, angel hair and fettuccini. Short goods, often referred to as macaroni, include macaroni, penne, rigatoni, fusilli and ziti. There are also many specialty or novelty shapes such as bow ties, shells, cannelloni, lasagna and wheels. In addition, some pastas now include spinach and other vegetable ingredients.



The biscuit and cracker industry in Canada manufactures plain and fancy biscuits, which include mallows and sandwich-type biscuits, snaps, soda biscuits, packaged cookies, crackers, fruit bars, graham wafers, ice cream cones and sugar wafers.

The bakery industry is made up of wholesale and retail subsectors. Wholesale bakers manufacture all types of bread, rolls, pizza dough/crusts, cakes, pies, doughnuts, muffins, pastries (uncooked, refrigerated/frozen), ice cream cones, wafers and matzo baking. Retail bakers produce and sell on the premises and cater to the demand for fresh-baked goods such as bread, rolls and pastries.

The prepared flour mix and breakfast cereal industry in Canada has two sectors. The prepared flour mix sector manufactures cookie, cake, doughnut, pancake and pastry mixes. The breakfast cereal sector manufactures cereals, either uncooked or ready-to-eat. Cake and pastry flour is milled from soft, white wheat. All-purpose flour is milled from hard wheat. Blends of these wheats are used extensively in these sectors.

Canada



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Wheat breeders at Agriculture and Agri-Food Canada are setting their sights on white wheats, a radical departure from the traditional red wheats that have established Canada's reputation as a leading world wheat exporter. White wheats allow millers to extract an additional 3 to 5 per cent more flour without risking the colour contamination that can occur with red wheats.

The Canadian Grain Commission's Grain Research Laboratory is the major centre in Canada for applied and basic research on the quality of a variety of grains. The laboratory also conducts studies on commercial processing of grains, using its pilot-scale malting plant, flour mill and bakery, noodle processor and small-scale pasta press. Scientists are developing new durum wheat varieties with extra gluten strength to fit the needs of the pasta-making world.

All grain-based products, domestic or imported, are subject to the *Food and Drugs Act* and Regulations, which are enforced by the Canadian Food Inspection Agency.

Additional information

In 2001, there were 28 flour mills operating in Canada, employing 2,000 people. About 80 per cent of milling wheat is exported rather than milled in Canada.

In 1997, there were 32 biscuit manufacturing establishments in Canada. Most were located in Ontario and Quebec, near major markets and the supply of soft wheat flour. In 1997, the industry shipped products valued at \$804.5 million.

In 1997, there were about 471 wholesale bakery establishments, which shipped products valued at nearly \$2.3 billion, and more than 3,000 retail bakeries, with an estimated annual sales of over \$600 million.

In 1997, the Canadian breakfast cereal and baking mix industry employed about 3,130 employees in 28 plants and had combined shipments of approximately \$1.1 billion.

In 1998, Canada exported \$287.4 million worth of biscuits and \$363.5 million worth of bakery products, mostly to the United States. The breakfast cereal and baking mix industry had export sales of \$141.5 million.

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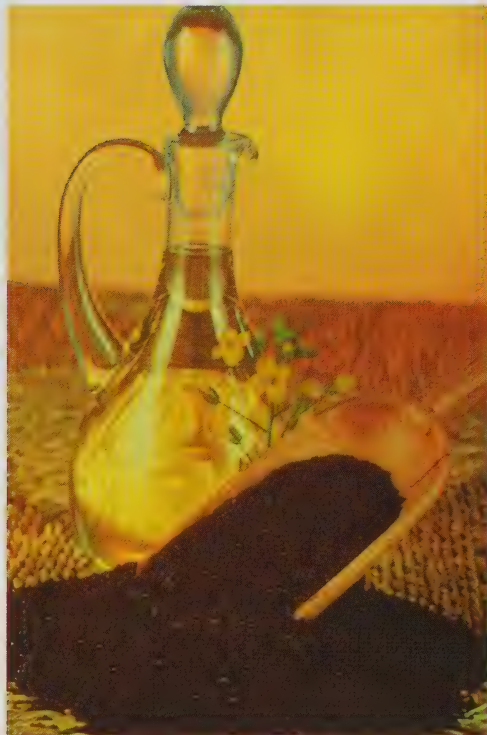
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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Grains and Oilseeds Industry

Canada produces a wide variety of grains and oilseeds, which are used in breads, pasta and breakfast cereals, cooking oils and other food products. In addition, innovative Canadian technology has created new products and markets for many grain and oilseed by-products.



Grains include wheat, corn, oats, barley and rye, while oilseeds include canola, soybean, flaxseed, safflower and sunflower seeds. Coarse grains, such as barley and corn, are used both for human consumption and as livestock and poultry feed. Oilseeds are used in the production of cooking oils and other food products, such as margarine.

Canadian farmers are also growing more specialty crops than ever before, such as mustard, lentils, peas, beans, chick peas and canary seed.

Canadian scientists have been able to discover many important sugars, organic acids and pharmaceuticals from grains. These include antibacterial compounds, antihistamines, antioxidants, steroids, vitamin E and anti-cancer agents, food and feed ingredients such as surfactants, sugars, sweeteners and emulsifying agents, and cosmetic co-products such as ultra-violet light barriers, cleansing agents and waxes.

The Canadian Grain Commission (CGC) maintains a quality control program that includes varietal control, licensing of elevators, product inspection and weighing, and sanitation and quality monitoring programs. The Commission is the major centre for applied and basic research on the quality of a variety of grains. Its Grain Research Laboratory also conducts studies using its pilot-scale malting plant, flour mill and bakery, noodle processor and small-scale pasta press. For more information on the CGC visit <http://www.cgc.ca>.

The Canadian Food Inspection Agency supports the Canadian grain sector through its quarantine, pest and phytosanitary certification programs.



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Canada



Additional information

Canada produced 61.7 million tonnes of grains and oilseeds in 2000–2001, including 26.8 million tonnes of wheat, 13.5 million tonnes of barley and 7.1 million tonnes of canola.

In 1999–2000, Canada produced 1.6 million tonnes of vegetable oil, mainly canola oil and soybean oil. Flaxseed, mustard seed and sunflower seed oils made up the difference. A significant portion of the canola oil used in the United States is either imported from Canada or produced from Canadian-grown canola seed.

In 2000, Canada exported \$9.2 billion worth of grains, oilseeds and related products representing 40 per cent of total agri-food exports. Canada exported \$4.3 billion in bulk grain, \$3.7 billion of which was in the form of wheat.

There are four major categories of wheat grown in Canada: spring wheat, winter wheat, durum wheat and feed wheat.

In 2000, Canada exported \$1.7 billion worth of grain products such as flour, pasta and malt.

Canada also exported \$1.7 billion worth of bulk oilseed. Canola is Canada's largest oilseed export, at 4 million tonnes, valued at \$1.2 billion. Exports of oilseed products such as oil and meal totalled \$751 million.

Between 1990 and 2000, Canada more than doubled both its canola and soybean production.

Corn yields in southwestern Ontario are now comparable with those in the United States Corn Belt.

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Canada's

Agriculture, Food and Beverage

INDUSTRY

Canada's Hemp Industry

Hemp has a long history. The world's premier renewable resource, hemp has been the source of food, fiber and fuel for the past 10,000 years. Popular in Canada in the 18th and 19th centuries, the crop became illegal in 1938. Today, however, hemp is enjoying a renaissance and the 10-year-old global hemp market is a thriving commercial success.

Since its legalization for research and commercial purposes in 1998, hemp has sparked much interest among Canadian farmers. The Government of Canada has been very supportive of Canada's re-emerging hemp industry through changes in legislation and regulations, and through the millions of dollars in research and development funding.

More than 600 Canadian farmers are now growing hemp in all provinces except the Atlantic region. They are taking advantage of the vast market potential for this crop. For example, hemp oil is considered one of the most nutritious oils for humans as it contains, in unique proportions, the essential fatty acids Omega-3 and Omega-6, and other amino acids that the human body does not synthesize by itself. In addition to having a pleasant nutty flavor, hemp seed oil is excellent for lowering cholesterol levels and strengthening cardiovascular system.

Automobile producers have successfully adopted hemp to help improve their image. In an effort to be perceived as "green," well-known European companies, such as Mercedes-Benz and BMW, now use hemp for interior components, including door panels and dashboards. The US automobile industry suppliers are following the European example and have started to use hemp to make stronger, lighter and relatively less-expensive composite panels.



One of the fastest growing market sectors for hemp seed oil is body care products market. The phenomenal essential fatty acid (EFA) content of hemp oil makes it ideal as a topical ingredient in both leave-on and rinse-off body care products. The EFAs help soothe and restore skin in lotions and creams, and give excellent emolliency and smooth after-feel to lotions, lip balms, conditioners, shampoos, soaps and shaving products.

With other large companies such as The Body Shop and Revlon already taking advantage of the moisture-retention qualities of hemp oils, the functionality and marketability of industrial hemp oil is expected to continue to increase steadily. Increased consumer awareness and product availability are expected to help expand the markets.

Hemp is also being used as an ingredient in beer, and a number of Canadian breweries have begun producing hemp beer.

Additional information

Hemp's remarkable attributes are hard to beat: it thrives without herbicides, it reinvigorates the soil, it requires less water than cotton, it matures in three to four months, and it can yield four times as much paper per acre as trees. Hemp can be used to create building materials that are twice as strong as wood and concrete, textile fiber that is stronger than cotton, better oil and paint than petroleum, clean-burning diesel fuel, and biodegradable plastics. In addition, it can produce more digestible protein per acre than any other food source.

Hemp seed is far more nutritious than soybean, contains more essential fatty acids than any other source, and is second only to soybeans in complete protein (but is more digestible by humans). The whole hemp seed contains roughly 25 per cent protein, 30 per cent carbohydrates, 15 per cent insoluble fiber, carotene, phosphorous, potassium, magnesium, sulfur, calcium, iron and zinc, as well as vitamins E, C, B1, B2, B3 and B6.

Although hemp and marijuana belong to the same plant species, neither hemp nor hemp seed contain THC, the psychoactive ingredient in marijuana.

The bark of the hemp stalk contains bast fibers, which are among the earth's longest natural soft fibers and are also rich in cellulose; the cellulose and hemi-cellulose in its inner woody core are called hurds. Hemp fiber is longer, stronger, more absorbent and more insulative than cotton fiber.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Honey Industry

Canadian honey is recognized around the world to be of the highest quality. Vast expanses of canola, clover and alfalfa provide foraging for bees, which produce a mild, white honey prized for its taste. The traditionally sunny and long summers of the Canadian prairies provide honeybees with access to bountiful flowering crops. The result: the average honey yield in Canada is twice the world's average.

Canadian honey is enjoyed in more than 25 countries. In 2000, 9,913 beekeepers in all 10 provinces and the territories maintained 603,828 beehives that produced 31,461 tonnes of honey valued at approximately \$75 million in farm-gate receipts. On average, Canada exports one third to one half of this honey each year.

The Canadian honey industry offers much more than just honey. Other honey by-products include:

- beeswax for candles and household products such as polishes;
- protein-rich pollen, which is used as a diet supplement;
- propolis, which is becoming widely known and accepted as an ingredient in cosmetics and lip balms, as well as a tonic; and
- royal jelly, a special feed produced by worker bees for the queen bee, which is used in skin creams and lotions.



The number of honeybee colonies/hives continues to rise, reflecting bee health and the demand for high-quality Canadian honey. Canada closed its border to honeybee imports from the continental United States in 1987, when the varroa parasitic mite was first detected.

The safety and quality of Canadian honey is second to none. The Canadian Food Inspection Agency, through the Honey Regulations of the *Canada Agricultural Products Act*, ensures that producers and importers meet strict federal standards.

In most provinces, the beekeeping industry is served by provincial apiculturists who are responsible for the registration of beekeepers, bee health, management practices and other issues affecting beekeepers.



Additional information

The Canadian honeybee industry is almost totally self-sufficient; it does, however, import, under permit, about 100,000 to 150,000 queen bees each year from Hawaii, New Zealand and Australia.

Bees play a vital role in the pollination of many crops. Fruit and vegetable producers rent beehives from beekeepers in the spring to make sure that pollination takes place. It has been estimated that honeybee pollination contributes up to \$1 billion annually in terms of increased agricultural production.

Packaged honey, which is filtered and can be pasteurised, doesn't need any preservatives and has a shelf life of up to two years.

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Canada's Agriculture, Food and Forestry INDUSTRY

Canada's Maple Syrup Industry

Canada produces more than 85 per cent of the world's maple syrup. It is the world leader in exports, selling more than 25,000 tonnes valued at \$105.9 million to more than 20 countries in 2000–2001. In Canada, the maple syrup industry is surpassed only by frozen french fries in single commodity exports.

Consumption of maple products increased from 110 grams per person in 1991 to 300 grams per person in 2000. Marketing has evolved from selling to traditional markets to more value-added markets such as blends with other products (cereals, yogurt, etc.). This industry contributes to Canada's value-added exports, since more than 60 per cent of maple exports are now shipped in pre-packaged containers.

In the early 1970s, science helped rejuvenate this industry by giving farmers new methods of production. Researchers looked at gathering sap with tubing, using vacuum pumps, reverse osmosis, and various types of evaporators, and addressing basic questions about how to make the industry more efficient. Today, Canadian production has some of the most innovative systems in maple technology.

The Canadian Food Inspection Agency monitors the safety and quality of maple syrup and ensures producers meet federal standards. These standards include three grades of maple syrup (Canada No. 1, No. 2 and No. 3) and different classes of colour.

During the growing season, maple trees accumulate starch. With the spring thaw, enzymes change this starch into sugar, which mixes with the water absorbed through the roots, imparting a slightly sweet taste. Maple sap contains water (about 97 per cent), minerals, organic acids and maple taste precursors. In early March, the sap starts to run for about six to eight weeks and gives energy to the tree to make it grow. All trees produce sap but maple trees produce more and sweeter sap than other trees.



Producers take great care to ensure long-term survival of their maple sugar bush. While collecting sap does rob a tree of some of its nourishment, no harm is done to the tree because less than one tenth of a tree's sugar is removed during tapping.

Additional information

There are more than 10,000 maple syrup producers in Canada, mostly in Quebec, with the rest in Ontario, New Brunswick and Nova Scotia.

The main syrup producing trees are sugar maples, red maples and silver maples.

During the maple sugaring season, an average tree yields between 35 to 50 litres of sap, which will produce between one to 1.5 litres of maple syrup. It takes on average, 40 litres of sap to make 1 litre of syrup.

A 50 ml serving of maple syrup contains 167 calories, 43 grams of sugar, 117 mg of potassium, 7 mg of sodium and no fat. It provides 6 per cent of the recommended daily intake of calcium and thiamin and 2 per cent of magnesium and riboflavin.

In 2001, Canada produced 20,122 kilolitres of maple products with an estimated farm gate value of \$140 million. Exports have increased from \$38 million to more than \$100 million in less than 10 years. Canada's largest export market is the United States, with about 80 per cent of total, followed by Europe with 16 per cent and Asia with 4 per cent.

Canada



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Other links

Table filière acéricole
(Export strategy in French only)
<http://www.agr.gouv.qc.ca/ae/filieres/acericol/faplans.htm>

Québec Maple Syrup Producers Federation
<http://www.maple-erable.qc.ca/>

Ontario Maple Syrup Producers' Association
<http://www.ontariomaple.com/>

Canadian Food Inspection Agency—
Maple regulations
<http://laws.justice.gc.ca/en/C-0.4/C.R.C.-c.289/index.html>

Institut québécois de l'érable Inc.
(Generic information in English)
<http://www.erable.org/eindex.htm>



Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Mustard Seed Industry

Canada is the world's single largest exporter of mustard seed and among the top five producers in the world. More than three quarters of the mustard seed produced in Canada is destined for export. Mustard seed is used primarily in the condiment and food industries, in the form of either seed or oil.

Canada produces three types of mustard: yellow, brown and oriental. Brown and oriental mustard seed are hot and spicy. Yellow is the mildest of the three varieties and has lower oil content. Oriental mustard seed is often used to produce spicy cooking oils, while brown mustard is used to prepare specialty mustards, such as Dijon. Mustard seed can also be milled into mustard flour and used as an ingredient in processed foods, such as salad dressings and soups.

A relative of canola, mustard seed has the advantage of being more tolerant to drought, heat and frost. It is an annual, cool-season crop that can be grown in a short growing season, commonly in rotation with small grains.

To date, Agriculture and Agri-Food Canada (AAFC) has undertaken the majority of mustard seed research in Canada. However, recently the industry has agreed on a levy that will support research projects. Over the last ten years, research stations in Western Canada have released consistently improving varieties of this crop. Present day varieties of yellow and oriental mustard have characteristics that are specific to various segments of the marketplace. Current objectives for breeding include the development of improved cultivar of all mustard varieties and a number of quality enhancements. These include better adaptation to the semi-arid soils, increase in yield as well as in oil and protein content. Some varieties with low oil content have also been developed for dry milling purposes. Recently, AAFC developed a new canola-quality mustard plant that could, potentially, be cultivated in drier regions of Western Canada.



Canadian production and exports have been fairly steady since the mid-90s at approximately 228,000 tonnes, except for 1999 where production rose to more than 300,000 tonnes, an increase of around 29 per cent over 1998. Exports for the same period have been ranging from 152,000 tonnes to 173,000 tonnes.

Canadian exports are affected by price level and crops in other major producing countries; India, Bangladesh and Pakistan. The United States is using more and more yellow mustard for processing, while northern Europe is using more brown mustard (to make Dijon mustard). Bangladesh consistently purchases substantial amounts of oriental mustard from Canada for oil crushing.



Additional information

Western Canada has been a major producer of mustard seed since World War II, when supplies from Western Europe—the historic base of production—were disrupted. Canadian mustard seed production is concentrated in the Prairie Provinces, particularly in Saskatchewan, which accounts for approximately 89 per cent of production. Seed yields of brown and oriental mustard are typically higher than yellow mustard.

The United States is the largest export market for Canadian mustard seed, importing about 31 per cent of total Canadian exports in 2001. Since 1995, the US market has accounted for approximately 35 per cent of Canadian exports.

The Far East, Bangladesh in particular, has become a significant export market. From 1995 to 2001, exports to Bangladesh averaged between 15 per cent and 20 per cent of total Canadian production. Belgium, Germany, Switzerland, Denmark and Japan also purchase yellow mustard seed from Canada.

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Further information on products, suppliers and investment opportunities in the Canadian agri-food industry is available on the Agri-Food Trade Service Web site at: <http://ats.agr.ca>.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Organic Industry

Organic agriculture is a holistic system of production with a principle goal to develop productive enterprises that are sustainable and harmonious with the environment. Organic foods are produced without the use of chemical fertilisers or synthetic pesticides, processed without the use of irradiation, and are not derived through genetic engineering. Livestock are provided ethical animal husbandry that promotes good health and prevents disease.

Canada is an ideal country for producing organic food because of its large and varied land base and its cooler climate, which reduces pest and disease problems. Canadian farmers' support for the organic way of life is growing. Currently, there are approximately 3,100 certified organic producers working about

340,000 hectares, more than 320 processors and handlers, and about 45 certification bodies, many with accreditation from various foreign accreditors. Organic grain production is the fastest growing sector and also represents by far the largest export commodity.

Most of Canada's organic products are exported, primarily to the United States where much of it is processed and resold to other markets. Canada also exports organic products to the European Union and Japan. Worldwide sales of organic products are estimated at \$20 billion, mostly in the United States, European Union and Japan. The Canadian organic sector is positioning itself to increase and diversify its market share in these and other markets.

The National Standard of Canada for Organic Agriculture was published in June 1999. The Standards Council of Canada is an internationally recognized accreditation body that accredits organic certification bodies in Canada in accordance with International Standards Organization guidelines.



<http://ats.agr.ca>

Canada



Additional information

- Regional organic farming organizations exist across Canada and a national grower organization, Canadian Organic Growers (COG), represents grower interests at a national level.
- The Organic Agriculture Centre for Canada was recently created to provide broad support for organic farmers and those in transition, through the development of new research programs, courses and deployment of effective methods for disseminating information.
- Saskatchewan, Ontario, Quebec and British Columbia are the main exporting provinces.
- Approximately one in twenty fruit and vegetable farms in Canada consider themselves to be organic producers.
- Canada is among the top five world producers of organic grains and oilseeds, with an estimated retail/food service value between \$700 million and \$1 billion, including processed and non-processed products.
- Canadian organic retail sales growth is expected to increase 20 per cent a year to \$3.1 billion in 2005.
- The industry has as a goal to increase its market share to 10 per cent of the Canadian retail market by 2010.

According to COG:

- Farm cash receipts from this industry reached about \$500 million in 2000, representing about 1.5 per cent of agriculture's total farm cash receipts; and
- The number of certified producers increased 34 per cent between 1999 and 2000.

For more detailed information

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Further information on products, suppliers and investment opportunities in the Canadian agri-food industry is available on the Agri-Food Trade Service Web site at: <http://ats.agr.ca>.

Useful links

Canadian Organic Growers
www.cog.ca

Organic Agriculture Centre for Canada
http://www.nsac.ns.ca/pas/staff/rma/Organic_Centre.htm

Standards Council of Canada
<http://www.scc.ca/certific/index.html>

Canadian General Standards Board
<http://w3.pwgsc.gc.ca/cgsb>

Canadian Food Inspection Agency
www.inspection.gc.ca

Education

McGill University
www.eap.mcgill.ca

University of Guelph
www.uoguelph.ca

Centre d'agriculture biologique du Québec
www.cab.qc.ca

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Canada's Agriculture, Food and Forestry INDUSTRY

Canada's Processed Fruit and Vegetable Industry

The processed fruit and vegetable industry in Canada produces canned, preserved and frozen fruit and vegetables, as well as fruit juices. Increasingly, the industry is also developing and marketing a wide range of value-added products.

Thanks to technological advances in the processing of fruits and vegetables, consumers are able to enjoy the full flavour and nutritional value of fresh fruits or vegetables throughout the year.

Some companies manufacture frozen prepared meals and canned specialties, such as frozen TV dinners, frozen pizza or canned ravioli. Many firms produce a variety of traditional value-added products, such as pickles, relishes, jams, soups, sauces and other items that incorporate a mix of vegetables or juices.

The industry is always working to improve the handling of processed fruits and vegetables. For example, scientists at the Agriculture and Agri-Food Research Centre in Kentville, Nova Scotia, have developed technologies to give industry a shelf-stable, low-acid, fruit-based product with good sensory, safety and processing qualities.

Many fruits and vegetables, such as blueberries, cherries and red onions, could go from the table to the medicine chest. Scientists at the Pacific Agri-Food Research Centre in Summerland, British Columbia, are looking at the antioxidant properties of anthocyanins, the pigments responsible for the reds, pinks and blues of many of our foods. Anthocyanins are able to bind readily with free radicals, rogue molecules implicated in the development of some cancers.



Canada

<http://ats.agr.ca>



Additional information

Overall, the food and beverage processing industry is the second-largest manufacturing sector in Canada in terms of shipments of goods made in plants and employment.

In 1998, the latest year for which statistics are available, the fruit and vegetable processing industry encompassed 216 establishments.

Processing plants shipped \$4.4 billion worth of products in 1998. About one quarter of this was exported.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Pulse Industry

Pulses are dry seeds of legumes that are used as food or feed. They include peas, beans, lentils and chickpeas. Pulses are excellent sources of proteins, vitamins, minerals and other nutrients while being low in fat and high in fibre. Pulses were first cultivated in the Middle East, Central and South America, but their nutritious qualities and taste have led to their extensive use around the world. There is now a renewed interest in pulses in both developed and developing countries.

Canada is a large producer and exporter of agricultural commodities and products, with a comparative advantage over other pulse producing nations. It can grow high quality pulses at relatively low costs because the climate is favourable and farmers alternate high scale production of pulses with that of cereals,

using modern agricultural technology in reasonably priced farmland. In fact, Canadian farmers can grow more pulses relative to cereal yields than almost any country in the world. Canada's cool climate provides pulse crops with natural protection against insects and disease. In addition, there is a well established infrastructure to store and move grain and pulses from the producing regions to the port terminals.

Pulse seeded area in Canada has increased 3,500 per cent between 1980 and 2001, and production peaked in 2000 at 4.4 million tonnes. The forecast is that this expansion will continue at the same rate during the next five years. Most of this growth is driven by international demand, as more than 70 per cent of the output is exported. The acceptance of these Canadian products is such that, during the last four years, pulses have been exported to 140 countries. Canada is now the world's largest exporter of lentils, peas and chickpeas and the fifth largest bean exporting nation.



Image courtesy of Pulse Canada



<http://ats.agr.ca>

Canada

The dramatic increase in demand for pulses is driven by several factors:

- Some country populations are growing at a pace that cannot be matched by the expansion of their own agricultural sectors.
- Globalization is allowing local producers to stop the cultivation of pulses for the domestic market if they can produce more profitable crops for exports.
- Weather patterns are changing and disturbing the expected agricultural output in some regions of the world.
- Health-conscious consumers in affluent markets are increasing their consumption of vegetal protein in their diet and pulses are the perfect fit for this purpose.
- Feed peas are used extensively as feed ingredient in Canada and the EU. Since feed ingredients formulated for cattle, swine, poultry and fish are under scrutiny because of their impact on the final meat product, feed peas are bound to take over a larger part of the international market.

Canada has taken a leadership role in innovative research and development in the pulse sector. Ongoing research and careful crop management have contributed to the high quality of Canadian crops. Importers have noted the willingness of the Canadian pulse industry to develop and produce new varieties in Canada in order to meet the taste of the international consumer.

In the absence of international standards, Canada has taken the lead in the development of terminology, protocols and standard evaluation methods for the worldwide pulse industry. Within Canada, the Canadian Grain Commission sets quality standards for pulse crops. Its programs result in shipments that consistently meet contract specifications for quality, safety and quantity. In 2001, the Commission launched a research program to grade lentils more effectively by using portable computerized image analysis technology.

Canada is also pursuing policies that will allow pulse producers to better meet their business needs while remaining market-oriented and globally competitive. These policies are integrating food safety, innovation and environmental responsibility.

Additional Information

Importers abroad can place their requests for Canadian pulses through the following Web site: www.pulsecanada.com

By completing an electronic order form, a request is quickly distributed to all Canadian pulse exporters members of the Canadian Special Crops Association. The list of members can be accessed at: www.specialcrops.mb.ca

For general information on Canadian pulses, please look at the following Web site: www.agr.gc.ca/mish/spcrops

For more detailed information

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Seed Industry

An estimated nine out of every ten bites of food available to people across the world begins with the planting of seeds. Canada's vibrant agriculture and agri-food sector produces a great variety of quality seeds for sowing, including major grains and oilseeds, special crops, pulses, forages and turf grasses, ornamental and garden seeds.

The Canadian seed industry generates \$770 million in combined domestic and export sales every year. Nearly three quarters of the seed produced in Canada is used for domestic purposes. The well-established domestic market provides a solid base from which Canadian seed companies can better serve international markets. And because Canada already exports seed to approximately 40 different countries, including the United States, Europe and China, it has the capacity and mechanisms to produce and export even more high-quality seeds.

Canadian commercial seed producers and companies produce and market both "certified" and "common" seeds to meet the diverse needs of growers. Certified seeds are verified for their genetic identity and purity by an external field inspector, and are used by farmers who want additional assurance on seed quality, varietal purity and performance. Common seeds are mainly found with forage crops. About one third of forage seed production is sold as common seed, mainly in Canada and in the United States. Common seeds are more affordable to growers as there is no requirement to meet the same quality control and production practices as for certified seeds. Common seeds also include farm-saved seeds.

Several of Canada's seed organizations are active in international seed networks.

The Canadian Seed Growers' Association (CSGA) is the sole pedigree agency in Canada for all agricultural seed crops except for potatoes and tree seeds. The CSGA is made up of 5,100 specialized seed producers in nine provinces: British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia and Prince Edward Island.



The Canadian Seed Trade Association (CSTA) is a voluntary association of 173 seed companies from across Canada. It represents a broad cross-section of Canadian businesses that develop, produce and sell seed. The CSTA represents nearly all Canadian seed exporters and Canada's seed exports. Membership varies widely from small firms specializing in garden seed and herbs to large co-operatives in Western Canada. The Association represents large multinational corporations with diverse interests as well as small family-run businesses. Many of the multinational seed companies have private plant breeding programs and are active in biotechnology. Members of the CSTA are involved in a number of initiatives, from variety exchange agreements at the R&D level to contractual agreements for production of seed for export and import. In addition, many member firms are involved in seed multiplication under contract for out-of-country customers.

The Commercial Seed Analysts Association of Canada (CSAAC) represents a group of professionals engaged in the assessment of the quality of sampling and testing of seeds. CSAAC members are hired by private seed testing laboratories or are part of staff members of seed companies who carry out their own seed analysis. Seed analysts carry out seed purity, germination and vigor tests, and identify diseases and prepare certificates of analysis for seed grading purposes.

The Canadian Seed Institute (CSI) provides specific quality assurance services to the seed industry. The CSI accredits seed companies and seed testing laboratories to help them comply with the Seed Act and its Regulations, which govern the seed sector.

Additional information

The total growing area of certified seeds was 547, 934 hectares in 2001, an increase of 5 per cent over 2000.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Snack Food Industry

Canada's snack food industry includes manufacturers of potato chips, corn chips, popcorn, pretzels, extruded cheese snacks, seed snacks, peanuts and peanut butter.

This industry has exhibited steady growth in recent years. In 1998, it accounted for 1.9 per cent of the total value of food and beverage shipments, 3 per cent of employment in the food and beverage sector, and 1.2 per cent of the food and beverage establishments (plants).

To remain competitive in both domestic and export markets, the industry has made efforts to increase efficiency and productivity by rationalizing plants and making significant upgrades to equipment.

According to the survey A.C. Nielsen's Market Track, Canadian consumers bought 4 to 7 per cent more potato chips, corn chips, pretzels, microwave popcorn and variety or multi-snack packs in 1999 than they did in 1998.

In 1998, the snack food industry employed 6,984 people, 15.6 per cent more than in 1990.

In 1998, 34 Canadian snack food manufacturers (potato chips, tortilla chips, pretzels, popcorn and cheesies) shipped \$1.16 billion worth of products, of this, 3 per cent, or \$35.4 million, were exported.

In addition, Canada imported \$130.7 million worth of snack foods (with \$125.9 million coming from the United States). This represented about 11 per cent of total shipments.

From 1990 to 1998, the value of Canadian shipments of potato chips, tortilla chips, pretzels, popcorn and cheesies grew 45.2 per cent, from \$796.4 million to \$1,156.7 million.



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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Sunflower Seed Industry

Canada produces both confectionery and oilseed varieties of sunflower seed, and is a competitive partner in the growing international market for this special crop. Despite its small production and exports volume, Canada exports nearly half of its production. The hardy sunflower has a wide range of uses, from the confectionary and baking industries, to the birdseed industry, to the animal feed industry.

Sunflower seeds pack a strong nutritional wallop. They contain almost every vitamin (except Vitamin C) and substantial amounts of key minerals, including magnesium, iron, copper and zinc. In addition, the protein content of sunflower seeds is so high, they can serve as a meat substitute. The confectionary variety is considered to be one of the healthiest snack foods available. Sunflower seeds, particularly the black oil-type, are also the favourite of most seed-eating birds.

There is a growing market for Canadian-grown sunflower seed. The birdseed market, for Canadian-grown sunflower seeds, is growing by 10 per cent annually in North America. Oil sunflower seeds are marketed primarily to the North American birdseed industry and include bulk shipments as well as cleaned and bagged product. Confection sunflower seeds are popular in Canada and in many countries of the Western hemisphere. Confectionery sunflower seeds fall into three categories: in shell, kernel and birdseed. Larger sunflower seeds (in shell) are roasted, salted and packaged for human consumption and are classified as either large or jumbo. Medium-sized seeds (kernel) are de-hulled and also packaged for human consumption. These are primarily used by the bakery industry, but are also traded domestically and exported. Smaller seeds, known as "striped birdfood," are sold in North American birdseed markets.



The black-shelled oilseed variety is richer in oil and therefore better suited to the production of sunflower oil. It is also used to produce ingredients for animal feed. Compared with other vegetable oils and animal fats, the oil in sunflower seed is very high in polyunsaturated fatty acids, making it easily digestible and provides a good option when choosing cooking oil, particularly if high cholesterol is a concern.

Because of a deep tap root system, sunflowers are very adaptable and can be harvested even after an early snowfall, without reduction in quality. This adaptability makes them a viable alternative to grains in the southern parts of the Canadian Prairies. Production in northern Canada is limited because of the colder climate.

Most sunflower research in Canada is done by the private sector, with some government research conducted in Brooks, Winnipeg and Morden in Manitoba. Research is focused on developing dwarf, short-season varieties such as Sunola™ which are well suited to the cooler farming climates of northern Canada.

Canada



<http://ats.agr.ca>



The National Sunflower Association of Canada is testing new varieties as well as managing growth in production and processing. With the development of higher-yield hybrid varieties, new herbicides and improved crop management techniques, the volume of sunflower seed production in Canada has doubled since 1996 from 55,000 tonnes to 119,000 tonnes.

Additional information

The sunflower is an annual broadleaf plant that grows well in most regions of Canada, but flourishes in the southern portions of Manitoba and Saskatchewan. It is the only oilseed native to the northern Great Plains of North America and has been grown commercially in Canada since the early 1940s.

The United States is the largest market for Canadian sunflower seed, importing more than 87,000 tonnes in 2001, or almost three quarters of Canada's total production. Belgium, Germany, Holland, Japan, the Middle East and South America also purchase Canadian sunflower seeds.

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Canada's Agriculture, Food and Beverage INDUSTRY

Canada's Vegetable Industry

Canada's varied climate has created unique opportunities for innovation and technological advances that are helping to ensure a ready supply of fresh vegetables year-round.

Those innovations include a thriving greenhouse sub-sector and some of the most advanced storage technologies in the world. Canadian researchers are also looking at ways to improve packaging that will help extend shelf life and expand markets. Plastics that allow air to circulate while retaining moisture are already in use, and the development of environmentally friendly plastic is a key component of current research.

There are about 16,500 vegetable growers in Canada producing close to 7 million tonnes of vegetables worth almost \$2 billion each year. Twenty per cent of these growers supply an estimated 80 per cent of Canada's production. In 2000, greenhouse production was 1.9 million tonnes. Indoor production facilities across Canada ensured a regular supply of fresh mushrooms, producing 73, 000 tonnes.

Canadian producers continue to improve production, product quality and marketing efforts to remain competitive in world markets and to continue export growth. Canadian scientists are studying the potential for introducing new vegetable varieties to Canada with characteristics that address risks to production, enhance freshness, facilitate economic diversification and that are adapted to specific regional growing conditions.

During the past five years, the volume of exports of fresh vegetables (excluding potatoes) has grown at a rate of 31 per cent per year to reach 347,000 tonnes, mostly in greenhouse vegetables and mushrooms. Canada also exported about 340,000 tonnes of fresh potatoes in 2000, and about 170,000 tonnes of seed potatoes to markets around the world.



Canada



<http://ats.agr.ca>

Potatoes, along with sweet corn and green peas, are the most extensively grown vegetables in Canada. About 4.5 million tonnes of potatoes are grown each year, more than half of them processed, mostly into french fries.

Other crops range from the native fiddleheads, wild garlic and rutabagas to the more common lettuce, onions, carrots, tomatoes and cabbage. Members of the cole crop family (broccoli, cauliflower, Brussels sprouts, cabbage and kale) also grow well in Canada. And new types of oriental vegetables now grown in Canada—like pak choi, bok choi, nappa and Chinese broccoli—are becoming increasingly popular in retail markets.

The organic agriculture industry in Canada is also growing very rapidly, encouraged by consumer demand at home and abroad. There are currently more than 3,000 organic farmers with an estimated total certified acreage of 340,000 hectares, about 150 processors and handlers, and about 45 certifiers, many with accreditation from various foreign bodies. About 1.6 per cent of the commercial vegetable area under cultivation in Canada produces organic vegetables. Government and industry are currently working on a national organic standard to ensure equivalency with those of our international clients.

Pesticide use in Canada is significantly lower than in many other countries, due in part to our cooler northern climate, and Canadian producers are using integrated pest management programs under which pest populations are monitored and the use of pesticides is precisely timed to maximize effect and minimize use.

The Canadian Food Inspection Agency (CFIA) monitors Canada's vegetable industry, taking random samples from greenhouses and fresh vegetable establishments to verify compliance with grade standards and safety regulations. CFIA inspectors also check to see that producers and packagers conform to very specific product labelling regulations.

For more detailed information

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Further information on products, suppliers and investment opportunities in the Canadian agri-food industry is available on the Agri-Food Trade Service Web site at: <http://ats.agr.ca>.

Canada's food and beverage industry is recognized internationally as being among the best in the world, both in terms of ensuring food safety and quality, and in providing a trade friendly environment. Consumers are more aware of food security, safety and quality, and are demanding more information about how their food is produced. More than ever, consumers want to know that their food is safe and that it has been produced in an environmentally responsible manner.

Canada's objective is to be the world leader in food safety, innovation, and environmentally responsible production and to be the best at meeting the needs of consumers at home and abroad.





Poultry industry

Poultry production and processing are among the most highly mechanised and effective sectors in Canadian agriculture. In fact, Canadian poultry processing plants can slaughter and prepare for market 25,000 broiler chickens per hour, while one person can operate a unit of 50,000 broiler chickens, which will provide 640 tonnes of meat annually.

In 2000, Canada produced poultry products worth \$1.6 billion and exported almost 12 million chicks, domestic fowl, turkeys, ducks, geese and game birds such as guinea fowl, pheasant, partridge, quail and squab to 20 countries.

Processed fruit and vegetable industry

The processed fruit and vegetable industry produces canned and frozen fruits and vegetables as well as value-added items that incorporate a mix of vegetables or juices, such as pickles, relishes, jams, soups, sauces and other products.

Technological advances in processing ensure that fruits and vegetables retain their full flavour and nutritional value. Canadian scientists have developed technologies to give the industry shelf-stable, low-acid, fruit-based products with good sensory, safety and processing qualities.

Pulse industry

Canada is one of the world's leading exporters of high-quality pulses—dried, edible seeds of leguminous plants, such as peas, beans, lentils and chickpeas. In 2000, Canada produced \$1.1 billion worth of pulses, and exported more than \$920 million to over 100 countries, including India, Spain, Bangladesh, the United States and Cuba.

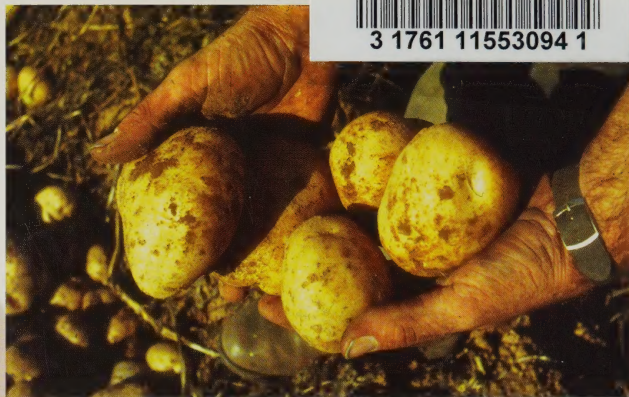
Canadian pulse production increased an average of 20 per cent annually during the 1990s, driven primarily by international market demand. Canada is the world's largest exporter of lentils, peas and chickpeas and the fifth largest exporter of beans. More than 70 per cent of the output is exported.

In order to facilitate world trade, the Canadian pulse industry has taken a leadership role in the development of international pulse quality standards. The private sector has also developed a national research strategy to coordinate and expand pulse research into new areas.

Red meat industry

Canada's meat processing companies make a wide variety of meat products, ranging from fresh or frozen meat to processed, smoked, canned and cooked meats, as well as sausage and deli meats. With annual shipments worth \$11.3 billion in 1999, it is the largest sector of the Canadian food manufacturing industry. In 1999, the industry placed fourth among Canada's leading manufacturing industries. In the past five years, Canadian red meat exports increased 103 per cent.

In addition to its red meat exports, Canada can provide halal-certified, kosher and a wide range of organic meat and poultry products, as well as game meat such as elk or bison.



Vegetable industry

Exports of Canada's fresh vegetables, including greenhouse vegetable and mushrooms, have increased significantly in recent years.

Potatoes, along with sweet corn and green peas, are the most extensively grown vegetables in Canada. About 4.5 million tonnes of potatoes are grown each year, over half of them processed, mostly into french fries.

Other crops range from the native fiddleheads, wild garlic and rutabagas to the more common lettuce, onions, carrots, tomatoes and cabbage. Members of the cole crop family (broccoli, cauliflower, Brussels sprouts, cabbage and kale), which feature prominently in cancer prevention research, also grow well in Canada. And new types of oriental vegetables now grown in Canada, like pak choi, bok choi, nappa and Chinese broccoli, are becoming increasingly popular in retail markets.



For more information

More detailed fact sheets are available in print or by visiting the Agri-Food Trade Service Internet site at <http://ats.agr.ca>.

The ATS provides international trade and investment information as well as exporting guidance, market analysis, country and product reports, market trends and opportunities, world trade news, global trade rules, information on trade shows and missions, international trade statistics, programs and services available, trade contacts, and links to other information sources. The site also promotes product suppliers and investment in the Canadian agri-food industry.

